the northern limit of this journey. It is the capital of the Eastern Bamangwatos, and the most important town in any of the independent native kingdoms in the interior of South Africa. It lies on the River Shoshon. The king's residence was built around the Kotla; the place has a circular space inclosed by a fence of strong stakes, the entrance being on the south side, opposite to which was an opening leading to another smaller inclosure, which was the king's cattle kraal, where his farm stock was kept at night, the horses being accommodated in the

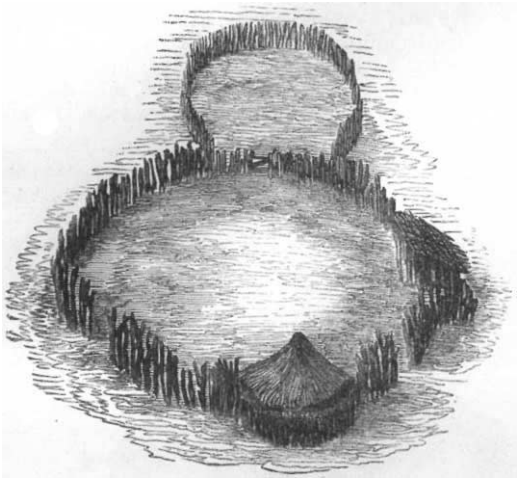

FIG. 3.

Kotla itself. Every night the entrances are made secure with stakes. Fig. 3 shows the king's kotla at Shoshong.

According to the missionary's (Mr. Mackenzie's) estimate, King Sekhomo's actual revenue was equivalent to about 3000*l.* a year, and consisted of cattle, ivory, ostrich-feathers, and skins; he had—happy man!—no state expenditure whatever. Dr. Holub's second expedition ended on April 7, when he arrived in safety with his large collections at Dutoitspan.

(*To be continued.*)

THE NEW INSECTARIUM IN THE ZOOLOGICAL SOCIETY'S GARDENS

ALTHOUGH of late years many entomologists have been in the habit of rearing insects in captivity for the purpose of watching their transformations and obtaining good specimens in each stage of existence, nothing like a systematic attempt, so far as we know, has been made to form a general collection of living insects for exhibition. As in former days as regards reptiles and the lower marine animals, so in the present instance as regards its insectarium, our Zoological Society seems to be first in the field; and so far as we can judge from the progress already made, to be likely, if not altogether successful, to attain many interesting and instructive results.

The building in the Regent's Park Gardens now used as an insectarium is constructed of iron and glass on three sides, with a brick back to it, and formerly formed part of the refreshment buildings. It was moved to its present site, on the north bank of the canal near the north entrance, last autumn, and has been used during the winter as a nursery for delicate monkeys and tropical birds. The cases containing the insects, to which it is now devoted, are arranged on stands all round the building, and also occupy two tables in the centre. The cases used for the principal specimens are formed of zinc plates. The upper part of them is glazed on all four sides, the top being formed of perforated zinc so as to admit the air. The food-plant or object required for the suspension of the chrysalises, when that stage of the insect is exhibited, is inserted into the case through a circular hole in the bottom, but the glass front also opens, so that ready access may be obtained to the interior. The larger cases in the front row measure about 24 inches in breadth by 18 in depth, and are 32 inches in height. The cases in the opposite row are of similar construction, but rather smaller in dimensions.

The cases on the south side (on each side of the entrance door) are mostly appropriated to the exhibition of the larger and finer species of silk-producing moths of the family Bombycidæ. Amongst them may be specially noticed Glover's Silk-moth (*Samia Gloveri*) and the Cercopian Silk-moth (*S. cecropia*) of North America, Perny's Silk-moth (*Attacus Pernyi*) of Northern China, the Tusseh Silk-moth (*A. mylitta*) of India, and the great Emperor Moth (*Saturnia pyri*) of Europe. These have been imported from their native countries in the stage of chrysalis. Of the first three above named, many examples are already hatched, and the splendid *imagines*, or perfect insects, are appearing one by one. Soon after appearing the sexes unite and eggs are produced, after which the parents quickly perish. The fertilised eggs remain to produce caterpillars, which will eventually form a second set of pupæ or chrysalises and thus continue the species.

On the north side of the Insectarium the smaller cases are devoted principally to the rarer and more noticeable moths and butterflies of Europe, such as the Swallow-tailed Butterfly (*Papilio machaon*), the Black-veined Butterfly (*Aporia cratægi*), the Purple Emperor (*Apatura iris*), and the Orange-tip (*Anthocharis cardamines*) among the former, and the Scarlet Tiger Moth (*Callimorpha dominula*) and Emperor Moth (*Saturnia carpini*) among the latter group. The series is continued, mixed with other forms, at the east end of the building. On the large tables in the middle of the Insectarium are examples of other butterflies, moths, beetles, mayflies, stoneflies, and aquatic insects of different kinds, all well worthy of attention and study. The whole series exhibited now contains examples of about fifty species, but daily additions are made to it.

Finally we should mention that every specimen in the Insectarium is distinctly labelled, and that over each of the principal cases is fixed a glazed box, in which are placed preserved specimens of the various stages of metamorphosis of the insect exhibited in the case beneath.

Nor must we forget to add that the Insectarium is under the sole charge of Mr. E. Watkins, an experienced entomologist and breeder of insects, whose name is well known to many naturalists. Mr. Watkins, whose services have been secured for the Zoological Society for the purpose of inaugurating this interesting exhibition, is in daily attendance at the Insectarium, and is most ready and willing to afford information and instruction to all who apply to him.

NOTES

THE numerous friends and still more numerous admirers of Prof. Gegenbaur will be glad to hear that he is now believed to be out of danger. It appears that the illness of the distinguished anatomist commenced with an attack of erysipelas, the origin of which is not known; it does not seem that the case was complicated by any blood poisoning, but there was an attack of peritonitis, which caused the very greatest anxiety for some days. Lately however his condition has considerably improved, but it will, of course, be a long time before he can be completely restored to health.

AT the *conversazione* given to Prof. Helmholtz at University College, Mr. Latimer Clark exhibited the accompanying

interesting unpublished letter from Sir Isaac Newton to Dr. Law :—

"*London, Dec.* 15, 1716

"Dear Doctor: He that in ye mine of knowledge deepest diggeth, hath, like every other miner ye least breathing time, and must sometimes at least come to terr; alt for air.

"In one of these respiratory intervals I now sit doune to write to you, my friend.

"You ask me how, with so much study, I manage to retene my health. Ah, my dear doctor, you have a better opinion of your lazy friend than he hath of himself. Morpheous is my best companion; without 8 or 9 hours of him yr correspondent is not worth one scavenger's peruke. My practizes did at ye first hurt my stomach, but now I eat heartily enow as y' will see when I come down beside you.

"I have been much amused by ye singular *φενομενα* resulting from bringing of a needle into contact with a piece of amber or resin fricated on silke clothe. Ye flame putteth me in mind of sheet lightning on a small—how very small—scale. But I shall in my epistles abjure Philosophy whereof when I come down to Sakly I'll give you enow. I began to scrawl at 5 mins frm 9 of ye clk, and have in writing consmd 10 mins. My Ld. Somerset is announced.

"Farewell, Gd bless you and help yr sincere friend

"(Signed) ISAAC NEWTON

"To Dr. Law, Suffolk"

VERY great progress is being made in Paris to render the forthcoming Electric Exhibition a success. There are sixty-four English exhibitors. The Post Office is going to make a very good display, and as the old apparatus of Ampère and Œrsted will be shown, it is hoped that those of Faraday and Wheatstone will be added.

L'Électricien is the title of a new fortnightly journal published in Paris and devoted to the interests of the science of electricity. It might have been thought that with *L'Électricité*, edited by M. Wilfrid de Fonvielle, and *La Lumière Électrique*, edited by M. le Comte du Moncel, appearing every week, the field would have been fully occupied. The latter journal is however somewhat more special in its aims, and the former appears to be at present given over to discursive maunderings on natural photophony and to rabid attacks upon Clerk-Maxwell's theory of electricity. At any rate there appears to be scope for a journal of a somewhat different order; and the pages of No. 1, now before us, contain valuable contributions from well-known pens. M. Mercadier contributes an article on the use of selenium in the photophone; M. Niaudet-Breguet writes upon the different systems adopted for central stations in telephone exchanges; Dr. de Cyon has an interesting article on electrobiology; M. Gaston Tissandier discourses on one of the domestic applications of electricity; while Prof. C. M. Gariel contributes a valuable discussion of the graphic method of representing Ohm's law and other laws of current electricity. The acting editor is M. E. Hospitalier, the well-known electrical engineer. The publication, which is illustrated, is got up in admirable style by the house of Gustave Masson. We wish all success to the undertaking so excellently begun.

THE Paris Municipal Laboratory for testing all matters having any bearing on health, and the organisation of which is now quite complete, was opened to the public on March 1. The establishment, which is situated at the Prefecture of Police, Quai du Marché Neuf, will be formally inaugurated to-morrow. The laboratory is already regarded as a success, the number of objects presented for analysis amounting in April to not less than 700, mostly wine purchased in shops, and suspected of being adulterated. The number of falsifications amounts to 80 out of 100. In every case where adulteration has been detected the results have been communicated to the competent authorities, who have prosecuted. Milk has been also sent in great quantity, and in many cases proved adulterated or mixed with water. The results of these inquiries have created such an agitation among Parisian milkmen that when they were surrounded at Batignoles Terminus and their boxes about to be opened for inspection, they resisted. A scuffle ensued between them and the police, and the result was that a number escaped. French chocolate has also been found very defective in quality, an immense number of substances having been added to it. The head of this new service is M. Ch. Gerard, a chemist of reputation. All the assistants are selected by competitive examination, and are only to remain in the service for a few years. They belong mostly to the School of Medicine and Pharmacy, so that the institution may be considered as a public school of practical chemistry. The general organisation is said to be modelled after the Chemical Laboratory at South Kensington. Notable features are the use of spectroscopic analysis combined with the electric spark, a workshop for photography, and the special service for trichinæ. The ordinary market-inspectors are trained to use special microscopes for that purpose. A special instrument has been constructed for boring in ham small holes which are not visible when cooked, and the particles of flesh so extirpated are analysed microscopically. A special apparatus has been designed and is in constant use for trying swine, and even the muscles of patients.

MR. MORRIS, the Director of Public Gardens and Plantationg in Jamaica, has recently issued a pamphlet entitled "Notes on Liberian Coffee, its History and Cultivation." In this pamphlet Mr. Morris has brought together a great deal of valuable matter connected with this remarkable species of *Coffea*, which will prove not only interesting to those who wish to see the resources of our Colonies developed, but particularly to those about to embark in the cultivation of coffee as an article of commerce. The pamphlet commences with some historical remarks on the species, and then touches on its introduction into Jamaica, followed by a consideration of the plant as found in Liberia, in the West and East Indies, of its propagation and the establishing of plantations with regard to climate, soil, and various other details; some interesting notes follow on the yield of Liberian coffee trees, and of the commercial value of the coffee itself. In view of this pamphlet being of considerable use to persons abroad who may be about to embark in the cultivation of this particular species, we may say that it is issued from the Government Printing Establishment at Jamaica, and that its price is sixpence.

A NEW medicinal oil has just been introduced into this country by Messrs. Burgoyne and Burbidges, the well-known chemists of Coleman Street. It is known as Oolachan oil, and is said to be scarcely distinguishable from cod liver oil. It is obtained from a fish called by the North American Indians Oolachan, or candle fish, from the fact that when dried the fish itself can be used as a torch or candle on account of the large quantity of oleaginous matter it contains. The fish is met with on the coasts of Vancouver's Island and British Columbia, and in the bays between the Frazer and Skuna Rivers. Similar in its habits to the salmon, it ascends the rivers to spawn once a year, but remains only for a very short period, sometimes not more than a day, and as this is the only time they can be caught by the Indians, the manufacture of the oil is somewhat precarious. The fish itself, which is about the size of a herring, is much esteemed by the Indians on account of its delicacy of flavour and valuable medicinal properties. In America the oil has already a great reputation as a valuable and efficient substitute for cod liver oil, and there is every probability as it becomes known in this country of its taking a prominent place as an important medicine.

M. HERVE-MANGON, the director of the Conservatoire des Arts et Métiers, has established a manufacture of pottery in the large hall, in order to make the Parisian public acquainted with several of the manipulations used in the large manufactories. This demonstration, which will be continued during several

Sundays, bears principally on the use of the lathe for modelling. M. Hervé Mangon, having established a Siemens electro-magnetic machine for lighting purposes at the Conservatoire, sends by request supplies to the several laboratories of the establishment. Up to the present moment it has been used only by photographers.

AT the adjourned ordinary meeting of the Sanitary Institute, to be held at 9, Conduit Street, on Wednesday, May 18, at 8 p.m., the discussion will be continued upon the address delivered by Dr. Richardson, F.R.S., Chairman of Council—"Suggestions for the Management of Cases of Small Pox, and of other Infectious Diseases in the Metropolis and Large Towns."

AT the meeting of the Iron and Steel Institute last week the papers were almost entirely of a purely technical or commercial character.

MR. CHARLES E. TURNER, Lector at the University of St. Petersburg, will begin a course of five lectures at the Royal Institution, on the Great Modern Writers of Russia—Pouschkin, Lermontoff, Gogol, Tourgenieff and Nekrasoff—on Saturday, the 21st.

AN International Medical Congress meets at Madrid on the 20th inst.

THE extinction of the Brush electric light in the City last week is stated to have been caused by the defective insulation of the wires.

ALL the large railway companies in the country have intimated their intention of sending engines to the typical engine exhibition to be held at Newcastle on the occasion of the Stephenson centenary.

THE annual meeting of the U.S. Society for the Promotion of Agricultural Science will be held at Cincinnati on Tuesday, August 16, the day preceding the session of the American Association for the Advancement of Science.

THE fifth and concluding course of Cantor Lectures for the present session at the Society of Arts will be by Mr. R. Brudenell Carter, on the subject of "Colour Blindness, and its Influence on Various Industries." The course consists of three lectures, the first of which will be delivered upon Monday next, the 16th inst. This lecture will deal generally with the subject. The second lecture will treat of methods of testing for colour blindness, the prevalence of the affection, mistakes of the colour blind, and methods of endeavouring to counteract the defect. The subject of the third lecture is specially the industries chiefly affected by colour blindness. In it an account will be given of recent legislation on the subject in America, and the necessity for it in this country.

MASSON of Paris has issued a third series of Prof. Paul Bert's "Revues scientifiques," published in the *République Française*.

THE Annual Report of the Belfast Naturalists' Field Club for 1879-80 tells of its continued prosperity, and contains an account of the various excursions made during last summer. Appended are "A List of the Post-Tertiary Foraminifera of the North-East of Ireland," by Joseph Wright, F.G.S., and "A List of the Mollusca of the Boulder Clay of the North-East of Ireland," by S. A. Stewart.

THE Birmingham Natural History Society has issued a *Report and Transactions* for 1880, which in quantity and quality does its members great credit. There is an interesting address by the president, Mr. W. Southall, and a number of natural history papers, some by outsiders, and one or two on subjects connected with local natural history. The Society is now housed in the Mason College.

IN compliance with the provisions of a recent decree, the system of Algerian telegraphy has been *rattaché* to the French administration, and is governed from Paris. The head of the Algerian service has been appointed director at Lyons.

THE annual *conversazione* given by the President and Council of the Royal Society was held on Wednesday last week. It was well attended, and there were numerous scientific and artistic novelties on view.

MR. E. IM THURM is writing on Aspects of Plant Life in British Guiana, in the *Gardeners' Chronicle*.

THE additions to the Zoological Society's Gardens during the past week include a Black-faced Spider Monkey (*Ateles ater*) from Eastern Peru, a Collared Peccary (*Dicotyles tajaçu*) from South America, presented by Mr. E. H. Dance; a Roseate Cockatoo (*Cacatua roseicapilla*) from Australia, presented by Sir Charles C. Smith, Bart.; a Swift (*Cypselus apus*), European, presented by Mr. H. H. Johnston; a Common Viper (*Vipera berus*), British, presented by Mr. John Poyer Poyer.

OUR ASTRONOMICAL COLUMN

THE COMET OF 1812.—Under certain suppositions as regards the epoch of perihelion passage of this comet, the return of which may now be expected, it will be necessary to search for it on a particular date, upon the assumption that it has yet a considerable orbital angle to describe before arriving in perihelion, because the geocentric position corresponding to a small orbital angle will place the comet too near to the sun's position to allow of observations. If we employ the elliptical elements deduced by Mr. W. E. Plummer from a new reduction and discussion of several of the most reliable series of observations in 1812, we find the following values of the comet's heliocentric equatorial co-ordinates and of the radius-vector for intervals of 100 days to 60 days before perihelion passage; the co-ordinates are referred to the equinox of 1881·0.

Time from perihelion.	*x*.	*y*.	*z*.	Log. radius-vector.
− 100 days ...	+0·5619 ...	−0·5939 ...	+1·6649 ...	0·2683
− 90 ,, ...	+0·5478 ...	−0·4432 ...	+1·5725 ...	0·2363
− 80 ,, ...	+0·5305 ...	−0·2904 ...	+1·4712 ...	0·2016
− 70 ,, ...	+0·5093 ...	−0·1357 ...	+1·3592 ...	0·1637
− 60 ,, ...	+0·4832 ...	+0·0209 ...	+1·2337 ...	0·1222

Combining these co-ordinates with the X, Y, Z of the *Nautical Almanac* for May 27·5 and June 26·5, days of new moon in the present year, we get the following results :—

For May 27·5

t.	R.A.	Decl.	Distance from earth.	Intensity of light.
− 100 days ...	15·2 ...	+63·9 ...	2·267 ...	0·057
− 90 ,, ...	23·5 ...	62·0 ...	2·201 ...	0·070
− 80 ,, ...	31·2 ...	59·4 ...	2·140 ...	0·086
− 70 ,, ...	38·3 ...	56·2 ...	2·083 ...	0·108
− 60 ,, ...	44·8 ...	+52·2 ...	2·030 ...	0·139

For June 26·5

t.	R.A.	Decl.	Distance from earth.	Intensity of light.
− 100 days ...	35·7 ...	+74·5 ...	2·146 ...	0·063
− 90 ,, ...	47·1 ...	71·4 ...	2·084 ...	0·078
− 80 ,, ...	55·8 ...	67·6 ...	2·027 ...	0·096
− 70 ,, ...	62·5 ...	63·1 ...	1·976 ...	0·120
− 60 ,, ...	67·8 ...	+57·9 ...	1·931 ...	0·153

These places will define the region of the sky where the comet should be sought, and telescopes of good optical capacity will be needed. When Pons discovered the comet on July 20, 1812, the theoretical intensity of light was 0·18.

The mean motion in 1812 not being ascertainable within very narrow limits, no attempt, so far as we know, has been made to determine the effect of perturbation in the present revolution, and we have therefore to be content with the method of careful sweeping over the region of the sky, on which the orbit may be projected at any time. Sir George Airy's orbit-sweeper, it is true, would limit the extent of sky-ground to be examined, but we suspect the only instrument of sufficient power yet mounted upon his principle is that at the Imperial Observatory at Strassburg, where it is not to be doubted that it will be put in active operation by Prof. Winnecke. We may remind the reader that